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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Donald Aves
Serial No.	:	09/320,303
Filed	:	5/26/99
For	:	METHOD FOR SELECTING OPTIMIZED LENGTHS OF A SEGMENTED TRANSMISSION LINE AND A TRANSMISSION LINE RESULTING THEREFROM
Group Art Unit	:	2123
Examiner	:	Hugh M. Jones

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APPLICANTS' REPLY BRIEF

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

SIR:

Applicant herewith submit this Reply to the Answer of the Examiner mailed January 28, 2003, in the above-identified application on appeal, in triplicate.

(3) STATUS OF CLAIMS

All claims have been finally rejected.

(5) SUMMARY OF INVENTION

The present invention provides a computer model for describing a performance of a segmented transmission line (Figs. 1-9) having a plurality of segments (page 13, lines 5-7), each segment having a transfer function (page 7, line 22), comprising:

(a) means for storing at least one characteristic value the transfer function of a respective segment of the segmented transmission line (page 13, lines 9-12);

(b) means for storing information relating to at least one algorithm, said algorithm being for determining the effect of a respective characteristic value and sequence of transmission line segments on a performance of the overall segmented transmission line (page 7, line 20-page 8, line 2); and

(c) means for adjusting a characteristic value (page 13, lines 15-18),

whereby a set of characteristic values is defined (page 14, Table 1, page 15, Table 2, page 17, Table 3) for respective transmission line segments, having an optimized performance in view of the at least one algorithm (page 13, lines 21-22).

The present invention also provides a method for optimizing the segment characteristics of a segmented transmission line (page 13, lines 5-7), comprising the steps of modeling the electrical performance of the segmented transmission line (page 13, lines 9-11), evaluating the model for electrical performance (page 13, lines 11-12, Figs. 1-9), and selecting a set of segment characteristics, based on the evaluation, which meets a set of predefined optimization criteria (page 14, Table 1, page 15, Table 2, page 17, Table 3).

The present invention further provides a computer system (page 13, lines 11-12) for describing a performance of a segmented transmission line having a plurality of segments (page 14, Table 1, page 15, Table 2, page 17, Table 3), each segment having a transfer function (page 7, line 22), comprising:

(a) a memory location storing at least one characteristic value the transfer function of a respective segment of the segmented transmission line (page 13, lines 9-10);

(b) a memory location storing information relating to at least one algorithm, said algorithm being for determining the effect of a respective characteristic value and sequence of

transmission line segments on a performance of the overall segmented transmission line ((page 13, lines 12-14); and

(c) a processor, executing a program for iteratively adjusting a set of characteristic values for respective transmission line segments (page 13, lines 18-21) to achieve an optimized performance (page 13, lines 21-23) within a predetermined performance constraint with respect to the at least one algorithm (page 9, lines 18-20).

The characteristic value may be a length of a respective transmission line segment (page 14, Table 1, page 15, Table 2, page 17, Table 3).

The at least one algorithm may calculate a transfer function of the segmented transmission line (page 7, line 22).

The adjusting means may allow adjustment of all characteristic values, the adjustments being based on a determined performance of the segmented transmission line (page 13, lines 12-14).

The segmented transmission line comprises, for example, an air-spaced coaxial transmission line adapted for transmitting an RF signal (page 16, lines 15-17), the performance comprising signal transmission efficiency (page 2, lines 1-3, page 17, lines 14-19).

The precision of the algorithm may exceed a manufacturing tolerance of the segmented transmission line ((page 14, Table 1, page 15, Table 2, page 17, Table 3, page 17, lines 21-22).

The model may further comprise means for outputting a predicted performance of the segmented transmission line based on the respective characteristic values (Fig. 5-9).

The respective characteristic values are generally non-incrementally and non monotonically distributed across a range. (page 14, Table 1, page 15, Table 2, page 17, Table 3).

A set of transmission line segments may be produced according to the selected segment characteristics. (Example 2, page 16, line 15-page 17, line 22).

The segment characteristic may comprise a respective segment length and the optimization criteria comprises a minimization of worst case VSWR over a radio frequency band. (page 4, lines 10-12).

The set of segment characteristics is generally in an optimal order. (Page 16, line 15-page 17, line 13).

The performance constraint may be a signal transmission efficiency (page 2, lines 1-3) or a VSWR (page 11, lines 13-14).

Please note that the claims as filed also provide support for the claims as now presented.

(6) ISSUES

1. Whether claims 1-25 are properly rejected under 35 U.C.S. § 112, first paragraph, as failing to be supported by an enabling specification.

2. Whether claims 1-25 are properly rejected under 35 U.C.S. § 112, first paragraph, as failing to meet the written description requirement

3. Whether claims 1-25 are properly rejected under 35 U.S.C. § 112, second paragraph, as being indefinite or failing to include missing steps or elements.

4. Whether claims 10-11 and 13-21 are properly rejected under 35 U.S.C. § 102(b) as being anticipated by Fleming-Dahl US 5,218,326.

5. Whether claims 1-9, 12 and 22-25 are properly rejected under 35 U.S.C. § 103(a) as being obvious over the '326 patent in view of Huss (IEEE article).

(7) GROUPING OF CLAIMS

The rejected claims of the application do <u>not</u> stand or fall together. Applicants request that each claim be examined on its own merits. Applicants set forth in the argument section below, why the claims of the group are separately patentable.

(8) ARGUMENT

ENABLEMENT, 35 U.S.C. § 112, FIRST PARAGRAPH

Claims 1-25 are rejected under 35 U.C.S. § 112, first paragraph, as allegedly failing to be supported by an enabling specification.

The Examiner makes the assertion that undue experimentation would be required to implement the invention. In fact, at the time of the invention, ordinary skill in the art, in view of the specification, would have known what a transmission line is, how to make one, how it operates, what its electrical behavior is (or at least how to determine it), and most importantly, the limitations of existing methodologies and the inherent compromises made in the art. A number of different software tools, including SPICE and MatLab, were available, as well a much more specialized tools specifically addressing the transmission line markets, for analyzing the properties and performance of segmented transmission lines.

One of ordinary skill in the art had the skill to either calculate the transfer function of a segment, or directly measure it, or employ available tools for this purpose. See, e.g., US 5,719,794 (Page 4, line 14), and US 5,436,846 (page 6, line 1), as well as page 7, line 20-page 8, line 10. In fact, the Examiner provides no evidence in support of his position, and rather seeks to impose an undefined burden on applicant. The Examiner has made no allegation that he is a person of ordinary skill, nor has he qualified himself as an expert to submit an affidavit as to what the level of skill in the art is. Therefore, the Examiner's unsupported legal argument does not constitute evidence. The available evidence, such as issued US patents which clearly discuss the availability of these techniques, and indeed report the results of the use thereof, do constitute substantial evidence that one of ordinary skill in the art at the time of the invention would have known how to establish a transfer function for a transmission line segment, and how to construct a model of the segmented transmission line, the model accounting for observed material behavior.

With respect to optimization, the art, including issued US patents, as well as a large mass of scholarly literature, see, e.g., http://citeseer.nj.nec.com/cs?q=optimization&cs=1 (more that **10,000** results!) clearly indicates that this is a mature field, and the mere reference to that field would have indicated to one of ordinary skill in the art the type of techniques which could be employed. The specification, in fact, does describe one such technique, which was used top generate the results reported in the specification.

Applicants thus take the position that the person to which this invention is directed would have been presented with the question, "how do I determine the lengths of transmission line segments?," as was previously presented in the art by Fleming-Dahl or other references cited in the specification. This hypothetical person would also have known the adverse consequences of selecting an inappropriate set of lengths. With this in mind, it is inconceivable that this hypothetical person would not, in view of the specification, been well aware of the measurement of electrical performance and VSWR of a segmented transmission line. Likewise, the hypothetical person of ordinary skill in the art would have at least rudimentary engineering or technical training, and would therefore understand the concept of a transfer function, since this is a basic concept. Finally, presented with the description in the specification, the person of ordinary skill would have, without the exercise of inventive skill, been able to implement a model of the segmented transmission line, and optimized the segment lengths, for example by successive iterations with increasingly smaller increments, as taught in the specification. Even were such a hypothetical person to adopt Huss as a starting point for an optimization in accordance with the present invention, he or she would have quickly determined that the technique was inoperative for this purpose (see below), and therefore refined the model to accurately predict the performance of the system.

The interrelated concepts of a model and transfer function are well known, and form the basis for first level engineering courses. No express teaching of these concepts is required in order to impart the person of ordinary skill with a capacity to model a segmented transmission line without undue experimentation or the exercise of inventive skill.

The level of ordinary skill in the art must be applied correspondingly for both 35 U.S.C. § 112 and 35 U.S.C. §§ 102-103. Therefore, it is inconsistent for the Examiner to argue that Fleming-Dahl; and Huss would have been known to a person of ordinary skill in the art, and applied to the problem presented herein, and that this same person of ordinary skill in the art would not understand the very concepts presented therein. The citation of these references by the Examiner serves as an admission that these are within the knowledge of one of ordinary skill in the art, and, in fact, is the <u>only</u> *evidence* presented by the Examiner as to this level of skill.

WRITTEN DESCRIPTION, 35 U.S.C. § 112, FIRST PARAGRAPH

Claims 1-25 are rejected under 35 U.C.S. § 112, first paragraph, as failing to meet the written description requirement, e.g., for failing to provide any substantive detail, other than mere reference, to a model, characteristic values, transfer functions, algorithms, distributions, and means for optimization. The Board is implored to review the entire specification, not merely page 13, as suggested by the Examiner. It will be seen, as per reference to the Summary of the Invention (section 5) provided above, that support is drawn from throughout the specification.

The Examiner states that he "does not know what the model is, how to build it with parameters, what the algorithm is, and how the optimization is carrier out." A model is quite simply a description of the relevant behavior of a system. The complexity of the model required depends on the relevance of the behavior. The specification, in fact, does provide guidance: page 7, line 20 - page 10, line 9, page 13, lines 9-23. It should be clear that a preferred implementation of the invention provides a "model" of the segmented transmission line, constructed using the transfer functions of the individual segments, with the optimization occurring by testing various sets of length combinations of the respective segments until a best, or at least a sufficient, result is obtained, using successive smaller increments.

Applicants have, indeed, presented actual data in the specification for results of the present invention, demonstrating its actual reduction to practice and utility. This data was obtained through the use of the method described.

The Examiner states that it is applicant's opinion that the prior art is enabled. In fact, issued US patents are presumed to be valid, and enablement is a requirement for a patent, therefore no affidavit need be presented supporting the enablement of a disclosure in an issued patent. On the contrary, in order to overcome the presumption of validity for an issued patent, the Examiner must make an affidavit that the prior patent is not enabled, suffering the presumably likely consequence of a *sua sponte* reexamination by the Commissioner of the Patent Office. Thus, the Examiner is in error regarding the legal presumption and attendant burden to overcome it.

The Examiner cites MPEP 2164.05 in support of his ability to make an enablement rejection and shift the burden to applicant; however, the question remains whether a "reasonable basis" has been established, and if so, whether applicants have overcome the applicable burden. In fact, the specification stands as a document under oath, and it is evidence of its content. The

Examiner has failed to define the level of skill in the art (except by implicit admission with respect to the art rejections), and therefore cannot have established a prima facie element of the rejection sufficient to give rise to the "reasonable basis". Likewise, the Examiner has repeated that *he* does not "know what the model is, how to build it with parameters, what the algorithm is, and how the optimization is carrier out." Is the Examiner representative of one of ordinary skill in the art? What are the Examiner's qualifications and experience? If presented with the computer code requested by him, would he be able to interpret it? Is the Examiner unaware of typical computer software, such as SPICE and Matlab, and other packages more specific for transmission lien analysis, which externalize the particular issues of implementing the model and optimization from the user? Please bear in mind that MPEP 2164.05 states: "The examiner should never make the determination based on personal opinion."

It is respectfully submitted that the Examiner has not met his burden of establishing a reasonable basis to question the enablement, and even if he has, applicant has rebutted any such presumption by citing particular passages of the specification, and establishing a level of skill in the art.

DEFINITENESS, 35 U.S.C. § 112, SECOND PARAGRAPH

The Examiner states that the meaning of "transfer function" in claims 8-9, 17-20, 22-25 is indefinite, and the specification does not clarify the meaning of the word. In fact, there is simply no ambiguity in the meaning of the phrase to one of ordinary skill in the art. There is a <u>single</u> concept invoked by this phrase, relating to a description of the transformation of a signal between input and output. The Examiner states that many different types of transfer functions may be defined; however, these are essentially various simplifications of a rigorous treatment; clearly, one may not make simplifying presumptions which omit material characteristics, while alleging that it remains the same: is a bicycle the same as car, merely because it makes the only simplifying presumptions of omitting two wheels and a motor? The transfer function, as required by the claim, is that formulation necessary to build the model, which itself describes material behavior(s) of the system.

The Examiner states that claims 1-25 are incomplete for omitting essential steps or elements, i.e., applicants have not claimed the details which are necessary for carrying out the optimization. In fact, optimizations are well known. The details of the optimization are quite

distinct from the present invention, which is a model, method, or computer program, which uses an optimization, of any type. Typically, such a "written description" rejection is asserted where applicant states that a particular step or element is a critical part of the invention, and then fails to so limit the claims. In the present case, applicants have made no such assertion, and Examiner indeed has admitted that the details of the optimization are missing from the specification. In fact, a description of the optimization *is* present in the specification, but no criticality alleged in the details thereof. Such an optimization proceeds to tune a set of parameters, to achieve an "optimum" condition. Perhaps the Examiner is confused by the simplicity of the technique, in seeking a deeper concept. No such depth is required for an understanding or implementation of the invention, and there is no alleged or admitted criticality to the optimization process per se.

The fact that the claims encompass future inventions does not mean that they are overbroad, and in fact, virtually <u>all</u> patent claims are likely to encompass such future embodiments. That applicants admit that unknown optimizations would fall under the literal claim scope is not a rationale for claiming defect in the claim structure.

It is respectfully submitted that these rejections should be reversed.

ANTICIPATION REJECTION 35 U.S.C. § 102

Claims 10-11 and 13-21 are rejected under 35 U.S.C. § 102(b) as being anticipated by Fleming-Dahl US 5,218,326 (hereinafter "the '326 patent").

As previously stated, the '326 patent relates to a mathematical method for defining a set of coaxial cable lengths, <u>in no particular order</u>, which operates in the abstract on pure numbers representing length ratios to achieve a desired set of relative lengths. At no time during the selection of the cable lengths according to the '326 patent is the <u>performance</u> of the segmented transmission line <u>modeled</u>, nor is the <u>model evaluated</u>.

The lengths are not analyzed by way of a model. The Fleming-Dahl reference is devoid of any disclosure that the electrical performance of a <u>model</u> of the segmented transmission line. The background section of Fleming-Dahl relates only to general concepts and the prior art, with no disclosure how or why such modeling (alleged by the Examiner to be outside the ordinary skill in the art) should be performed. Indeed, Col. 2, lines 1-54 appear to teach <u>away</u> from a

complex impedance modeling approach. This impedance, when rigorously represented, may be equivalent to a transfer function.

The passage on Col. 4, lines 14-32, does not state that the system is modeled, and in fact the passage is consistent with actual measurement of performance (see Col. 4, lines 30-32). The passage on Col. 4, lines 17-20, in fact, relates to a power analysis, which is admitted by Fleming-Dahl on Col. 1, lines 43-68 as being an inaccurate representation of component behavior, and thus also fails to represent a model, since it admittedly fails to represent material behavior of the system.

The Examiner has therefore failed to set forth a prima facie case of anticipation of claim 10, and claims dependent therefrom, since material elements of the claim are absent from the reference.

OBVIOUSNESS REJECTION 35 U.S.C. § 103

Claims 1-9, 12 and 22-25 are rejected under 35 U.S.C. § 103(a) as being obvious over the '326 patent in view of Huss.

The Examiner admits that Fleming Dahl fail to disclose a transfer function (i.e., a performance assessment parameter), for which Huss is cited as supplying the missing teaching. Note that applicants distinguish principally on the basis that Fleming-Dahl do not employ a transfer function in their method, and reserve judgment as to whether a transfer function is expressly or inherently disclosed. In any case, the development of a suitable transfer function of a transmission line segment was within the scope of the ordinary skill in the art at the time of the invention.

The Examiner, by applying Huss, seeks to muddy the waters by presenting a *false* model, with an express disclaimer that the results presented are based on numerous simplifying presumptions, and that the results are limited to applications where such presumptions are immaterial. In fact, a reading of this reference would directly indicate to one skilled in the art that various shortcuts and simplifications are being made which will necessarily result in inaccuracies. A further reading would force the person of ordinary skill in the art to conclude that the simplifying presumptions would likely result in material errors.

The Abstract of Huss clearly states: "The lumped element model uses pole zero ***approximations*** to cable transfer functions." Page 1845, Col. 2, after equation 13 states: "To model a distributed circuit with lumped elements, the system response ***must*** be approximated by a pole-zero system.... Other lumped element models... assume that the impedance is complex. These models are more complicated and ***cannot*** be used to build hardware models of the cable." Likewise, it would be clear to one of ordinary skill seeking to build a model of the behavior of a segmented transmission line, that the order of elements cannot be ignored by lumping the elements, while achieving a suitable result representing an optimization, since reflections over multiple segments are clearly possible, and their effects material. In using a the simplified analysis of Huss, the optimization would simply fail.

In particular, it should be clear from a review of Huss that it is only concerned with forward transfer, and does not address reflections at discontinuities. Simplifying presumptions are apparent at almost every stage of Huss' analysis, resulting in an analytic framework which is inapplicable for a useful optimization of a segmented transmission line according to the present invention. In short, the "model" presented fails to account for material behavior of the system, and must be rejected as such. In addition, the analysis of Huss is not segment-order dependent, and thus an optimization based thereon, either alone or in combination with Fleming-Dahl, would not yield an ordered set of segments. Thus, claims 1 and 22 are clearly distinguished. Further, neither Fleming-Dahl nor Huss teaches or suggests an iterative process for optimization, thus distinguishing claim 22.

SEPARATE PATENTABILITY OF THE CLAIMS

Independent claims 1, 10, 22, do not stand or fall together because they have material differences in scope. Claim 1 provides a computer model, while claim 10 provides a method for optimizing and claim 22 provides a computer system. Claim 1 provides an algorithm, while claim 10 simply models the electrical performance, and claim 22 provides a processor for iteratively adjusting. Claims 1 and 22 provide a transfer function, while claim 10 does not. Therefore, these claims are materially different and must be analyzed separately. See argument above.

In fact, claims 1, 10 and 22 are separately patentable since the prior art as applied is not generic. Each of the independent claims has limitations, as described above, to which the art

must be applied distinctly. For example, Claim 1 relates to the model itself, and not the method or implementing computer system. As such, Fleming-Dahl do not claim to model the system, and Huss merely presents a simplified model, which fails to serve as a suitable model for application to the present problem, and would be inoperative to achieve the results set forth for the present invention. In particular, Huss does not describe the effect of a sequence of segments on the overall result. The prior art does not teach modeling the electrical performance of the transmission line, as required by claim 10. Note that when modeling a structure, one must describe its relevant behavior. The evidence presented by applicant in the specification demonstrates that the techniques of Fleming-Dahl or Huss fail to account for significant behavior, and therefore cannot be construed as models. The applied art does not teach or suggest an iterative process, as set forth in claim 22. It is thus apparent that each of the independent claims raises distinct issues, and must be analyzed separately.

Claims 2, 11 and 23, from respectively different parent claims, provide that the set of segment characteristics comprises a respective length of each segment. Fleming-Dahl relates only to segment length, while the independent claims encompass optimization of other parameters. See, page 9, lines 5-6. Thus, these claims materially differ from their respective parent claim with respect to application of the art.

Claims 3 and 12, from respectively different parent claims, provide that the model is evaluated to determine a transfer function of the segmented transmission line. Fleming-Dahl do not application of a transfer function, while Huss teach, at best, a poor (for present purposes) approximation of an transfer function. Therefore, the addition of a transfer function by these dependent claims differ from their respective parent with respect to application of the art.

Claim 4 provides that the adjusting means allows adjustment of all characteristic values. This is a separate and distinct limitation from any of the independent claims, and represents a separate distinction from Fleming-Dahl.

Claims 5 and 13, from respectively different parent claims, provide that segmented transmission line comprises an air-spaced coaxial transmission line. This limitation is distinct from the respective parent claims, which encompass other types of transmission lines, and thus differ from their respective parent claim with respect to application of the art.

Claims 6 and 14, from respectively different parent claims, provide that the precision of the algorithm or evaluation exceeds a manufacturing tolerance of the segmented transmission

line. Fleming-Dahl indicates that the manufacturing tolerance is about ± 0.125", while the algorithm produces about 4 significant digits. However, the underlying process differs from that of the present invention: Fleming-Dahl provides a simple mathematical formula to define a cable length, while the present invention provides an iterative optimization. The accuracy of the optimization is therefore of a different character than a simple calculation of a prime root scaling. This especially the case wherein the optimization proceeds with successively smaller increments, and the claim therefore addresses a novel and non-obvious aspect of the optimization process, and thus differ from their respective parent claim with respect to application of the art.

Claims 7 and 15, from respectively different parent claims, provide a further means or step of outputting, a predicted performance of the segmented transmission line based on the respective characteristic values. Fleming-Dahl do not address predicting a performance of a cable, while Huss do not accurately predict the performance of a segmented transmission line, since Huss employs a simplified analysis and a "pole-zero" approximation of actual performance, and thus differ from their respective parent claim with respect to application of the art.

Claims 8 and 17, from respectively different parent claims, provide that the respective characteristic values are non-incrementally distributed across a range. Fleming-Dahl does indeed stand for the proposition that the increments in cable lengths should not only be non-incremental, but also have no common roots. However, Fleming-Dahl do not employ an optimization technique per se, and instead rely on a predefined formula. The optimization technique could conceivably result in an incremental spacing, but claims 8 and 17 define that it does not. Therefore, claims 8 and 17 thus differ from their respective parent claim with respect to application of the art.

Claims 9 and 18, from respectively different parent claims, provide that the respective characteristic values are non-monotonically distributed across a range. Fleming-Dahl do not discuss the order of elements; or rather, there is no statement that the segments are not placed in size or arbitrary order. Therefore, the limitation that the segments are non-monotonic provides a novel and non-obvious distinction, and thus differ from their respective parent claim with respect to application of the art.

Claim 16 provides the step of producing a set of transmission line segments according to the selected segment characteristics. Indeed, Fleming-Dahl do discuss producing a set of

transmission line segments, but the underlying theory of segment length differs, and therefore the claim is distinguished. This claim adds a material step, and thus differs from its respective parent claim with respect to application of the art.

Claim 19 provides that the segment characteristic comprises a respective segment length and the optimization criteria comprises a minimization of worst case VSWR over a radio frequency band. Neither Fleming-Dahl nor Huss discusses an optimization of performance, and therefore the imposition of any optimization criteria is believed novel and non-obvious, and this claim differs from the respective parent claim with respect to application of the art.

Claim 20 provides that the segmented transmission line comprises an air-spaced coaxial transmission line adapted for transmitting an RF signal; the segment characteristic comprises a respective segment length; and the optimization criteria comprises a minimization of worst case VSWR over a radio frequency band. See discussion of claims 11, 13, and 19, supra, the combination of which is believed to distinguish any particular individual aspect.

Claim 21 provides that the set of segment characteristics is in an optimal order. Neither Fleming-Dahl nor Huss discusses any order-sensitivity at all, and therefore it is inherent that there is no optimization of segment order, and this claim differs from its respective parent claim with respect to application of the art.

Claim 24 provides that the performance constraint is selected from the group consisting of a signal transmission efficiency and a VSWR. The respective parent claim does not discuss the particular performance constraint, and thus this claim is believed to add a novel and non-obvious limitation to the claim.

Claim 25 provides that the segmented transmission line comprises an air-spaced coaxial transmission line adapted for transmitting an RF signal, the characteristic value being a length of a respective transmission line segment, the optimized respective characteristic values being non-incrementally and non-monotonically distributed across a range. See discussion of claims 11, 13, 17 and 18, supra, the combination of which is believed to distinguish any particular individual aspect.

Each claim cited above is therefore is distinct and has separate basis for patentability, and should be analyzed separately.

CONCLUSION

Applicants therefore respectfully submit that the applicant was in possession of the invention at the time of the application, the presently claimed invention is adequately supported by the specification, includes definite claims, and is not anticipated nor obvious in view of the '326 patent alone or in view of Huss, and therefore that the present Final Rejection should be reversed.

Respectfully Submitted,

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March 28, 2003

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Tracking People with Twists and Exponential Maps - Bregler, Malik (1998) (Correct) (71 citations)
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and don't lead to a simple formulation in the **optimization** procedure (for example [2] propose a 3D
the user supplied model joint locations. The **optimization** is done over the poses, angles, and body
www.cs.berkeley.edu/~bregler/bregler_malik_cvpr98.ps.gz

One or more of the query terms is very common - only partial results have been returned. Try Google (RI).

An Overview of Evolutionary Algorithms in Multiobjective.. - Fonseca, Fleming (1995) (Correct) (124 citations)
of Evolutionary Algorithms in Multiobjective **Optimization** Carlos M. Fonseca y and Peter J. Fleming
evolutionary algorithms (EAs) in multiobjective **optimization** is currently receiving growing interest from
evolutionary algorithms, multiobjective **optimization**, fitness assignment, search strategies. 1
www.lania.mx/~ccoello/EMOO/fonseca95.ps.gz

Multicast Routing for Multimedia Communication - Kompella, Pasquale, Polyzos (1993) (Correct) (99 citations)
multicast trees have been developed with two **optimization** goals in mind. The first is the minimum
Both the heuristics take advantage of this **optimization**. 3 We present below simulation results that
*fC =PC (v w) if P(v) Delta *For further **optimization**, use a better edge cost after conflict
ftp.cs.ucsd.edu/pub/csl/Multicast/ConstSteiner.ps.Z

Parameter Estimation Techniques: A Tutorial with Application to.. - Zhang (1997) (Correct) (36 citations)
estimation problem is usually formulated as an **optimization** one. Because of dioeerent **optimization**
as an **optimization** one. Because of dioeerent **optimization** criteria and because of several possible
of parameter estimation can be related to four **optimization** problems: ffl criterion: the choice of the
zenon.inria.fr/pub/rapports/RR-2676.ps.gz

Solving Polynomial Systems Using a Branch and Prune.. - Van Hentenryck.. (1997) (Correct) (30 citations)
and bound approach used to solve combinatorial **optimization** problems. Newton uses intervals to address the
and J. Rokne. New Computer Methods for Global **Optimization**. Ellis Horwood Limited, Chichester, 1988. 22]
Hentenryck. A Logic Language for Combinatorial **Optimization**. Annals of Operations Research, 21:247-274,
ftp.cs.unh.edu/pub/csp/archive/papers/hentenryck-mcallester-kapur.ps.gz

Sequential Quadratic Programming - Boggs, Tolle (1995) (Correct) (43 citations)
method for solving nonlinearly constrained **optimization** problems. As with most **optimization** methods,
constrained **optimization** problems. As with most **optimization** methods, SQP is not a single algorithm, but
and quasi-Newton methods to the constrained **optimization** setting. Thus one would expect SQP methods to
math.nist.gov/pub/boggs/sqp.ps.Z

Applications of Machine Learning and Rule Induction - Langley, Simon (1995) (Correct) (38 citations)
genetic approaches to both machine learning and **optimization** problems. Applications of Machine Learning
evaluation of explanation-based learning as an **optimization** tool for a large-scale natural language
www.isle.org/~langley/papers/app.cacm.ps

Survey of the State of the Art in Human Language.. - Cole, Mariani.. (1995) (Correct) (37 citations)
:419 Ronald M. Kaplan 11.7 **Optimization** and Search in Speech and Language Processing :
the acoustic models. Estimation is driven by an **optimization** criterion that tries to minimize the overall
R.Flammia, G.and Kompe, R. 1992)Global **optimization** of a neural network-hidden Markov model
speech.cse.ogi.edu/pub/docs/HLT/chpt1.ps.gz

Code Generation for Multiple Mappings - Kelly, Pugh, Rosser (1994) (Correct) (39 citations)
from which overhead will be eliminated. This **optimization** algorithm is described in Section 7. Once we
in Section 7. Once we have performed this **optimization**, we generate the actual code using the
sub-trees of the AST that are modified by the **optimization** phase. The algorithm is given in Figure 5 and

ftp.cs.umd.edu/pub/papers/papers/ncstrl.umcp/CS-TR-3317.1/CS-TR-3317.1.ps.Z

Robust Linear Programming Discrimination Of Two Linearly.. - Bennett, Mangasarian (1992) (Correct) (53 citations)
To Appear In **Optimization** Methods And Software Robust Linear
is based on the following error-minimizing **optimization** problem (2:1) min wfl 1 m fl fl \Gamma
begin our analysis by justifying the use of the **optimization** problem (2.1) which minimizes the average of
ftp.cs.wisc.edu/tech-reports/reports/91/tr1054a.ps

Two Classes of Boolean Functions for Dependency Analysis - Armstrong, Marriott.. (1994) (Correct) (36 citations)
Languages]Processors-compilers, **optimization** F.3.1 [Logics and Meanings of Programs]
Abstract interpretation, Boolean algebra, code **optimization**, decision diagrams, deductive databases,
www.cs.mu.oz.au/~harald/papers/sas94.tr.ps.gz

Face Recognition From One Example View - Beymer, Poggio (1995) (Correct) (30 citations)
(b) the computational expense of a non-convex **optimization** problem at run-time. However, since this
publications.ai.mit.edu/ai-publications/1500-1999/AIM-1536.ps.Z

On the Use of Non-Stationary Penalty Functions to Solve Nonlinear .. - Joines (1994) (Correct) (35 citations)
Functions to Solve Nonlinear Constrained **Optimization** Problems with GA's Jeffrey A. Joines and
reported.1 Introduction Constrained function **optimization** is an extremely important tool used in almost
research, mathematics, and etc. Constrained **optimization** can be represented as a nonlinear programming
www.fmmcenter.ncsu.edu/fac_staff/joines/papers/./papers/gacons.ps.gz

Run-time Code Generation and Modal-ML - Philip Wickline (1998) (Correct) (15 citations)
is that opens the possibility of low-level code **optimizations** (such as register allocation, instruction
values that are not known until run time. Such **optimization** cannot normally be expressed by a
into which the code is emitted can be used for **optimizations**. For example, the following is a higher-order
www.cs.cmu.edu/afs/cs.cmu.edu/project/fox/mosaic/papers/fp-ccam-98-100.ps

Algorithms For Vertex Partitioning Problems On Partial k-Trees - Telle, Proskurowski (1997) (Correct) (20 citations)
Introduction. Many inherently di#cult (NP-hard) **optimization** problems on graphs become tractable when
A large class of inherently di#cult discrete **optimization** problems can be expressed in the vertex
In this section, we define a class of discrete **optimization** problems in which each vertex has a state, an
epubs.siam.org/sam-bin/getfile/SIDMA/articles/27582.ps.Z

Java for Parallel Computing and as a General Language for.. - Fox (1997) (Correct) (20 citations)
locate inspection ports, and other life-cycle **optimization** issues [Fox:96e]Fox:97b]Metaproblems have
allowed by Java that could restrict compiler **optimizations**. Users would need to avoid complex exception
and their absence, of course, allows much more **optimization** for both sequential and parallel codes.
www.npac.syr.edu/projects/javaforcse/cpande/overview1.ps

Dynamic Algorithms in Computational Geometry - Chiang, Tamassia (1992) (Correct) (44 citations)
by many important applications in network **optimization**, VLSI layout, computer graphics, and
cis.poly.edu/chiang/cg-survey.ps

Real-world Data is Dirty: Data Cleansing and The Merge/Purge.. - Hernandez, Stolfo (1998) (Correct) (13 citations)
neighborhood in a linear list, as well as an **optimization** of this basic technique that seeks to
list. We note with interest that the sorts of **optimizations** detailed in the AlphaSort paper (AlphaSort94)
"worst-case" execution time for this phase. Any **optimization** will only decrease the total incremental
www.cs.columbia.edu/~mauricio/papers/jdmkd.ps

A Parallel Genetic Algorithm for the Set Partitioning Problem - Levine (1994) (Correct) (26 citations)
problem-a difficult combinatorial **optimization** problem used by many airlines as a
been proposed for the solution of combinatorial **optimization** problems. These methods, such as genetic
problem-a difficult combinatorial **optimization** problem that is used by many airlines as a
www.dai.ed.ac.uk/groups/evalg/Local_Copies_of_Papers/Levine.A_Parallel_Genetic_Algorithm_for_the_Set_Partitioning_

Vapnik-Chervonenkis Dimension of Recurrent Neural Networks - Koiran (1997) (Correct) (15 citations)
(see e.g. 9]for associative memory and **optimization**. Among other applications, they have been
www.math.rutgers.edu/~sontag/FTP_DIR/koiran-dam.ps.gz

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